

**RRS MODIFICATION NOTE 8, REVISION A**

Operations Division  
W/OPS12: HE

**SUBJECT:** **Vaisala SPS Installation**

**PURPOSE:** To replace the Sippican Signal Processing System (SPS) with a Vaisala SPS at selected RRS sites

**SITES AFFECTED:** Sites that have been designated as Vaisala radiosonde sites, and other sites as designated by OPS22

**AUTHORIZATION:** The authority for this note is Request for Change (RC) 13226.

**VERIFICATION STATEMENT:** This procedure was tested and verified at the Sterling Field Support Center (SFSC) and at six Operational Test & Evaluation (OT&E) sites.

**ESTIMATED COMPLETION DATE:** As specified by OPS22

**TIME REQUIRED:** Approximately 3.0 hours

**ACCOMPLISHED BY:** NWS Electronics Technicians

**EQUIPMENT AFFECTED:** Vaisala and Sippican Radiosonde systems

**SPARES AFFECTED:** ASN: J700-1A3A7-1, Sippican SPS and associated cables

**PARTS/MATERIALS REQUIRED:** ASN: J700-1A3A7-2, Vaisala SPS Assembly-GPS  
This Assembly includes:

- Vaisala SPS (SPS321AG)
- Frequency Setting Device (GC25-FSD)
- SPS Ethernet Cable TCP/IP (212326, straight)
- Intermediate Frequency (IF) Cable (DRW227382)
- COM1 Data Cable RS232 Serial (DRW227384)
- COM2 Data Cable RS232 (DRW227383)
- Mains Power Cable (USA-type power cord)
- Grounding Strap (Vaisala-provided)
- Event Marker Cable (NWS-provided cable)
- GPS Antenna Cable (NWS-provided cable)
- RRS Workstation (RWS) Software Version (V) 2.2 CD
- Vaisala Radiosonde (RS92-NGP)

**SOURCE OF PARTS/MATERIALS:** Initial issue by the RRS Program Office. Replacement components from National Logistics Support Center (NLSC).

**DISPOSITION OF REMOVED PARTS/MATERIALS:** Return Sippican SPS with cables to:  
NLSC  
1510 E Bannister Road  
Kansas City, MO 64131

TOOLS AND TEST EQUIPMENT  
REQUIRED:

- DCE Crossover Ethernet Cable (locally provided)
- Flathead Screwdriver, 3mm or 4mm (from Telemetry Receiver System (TRS) Tool Kit)
- Light (Utility or Flashlight)
- Laptop Computer (optional for Digital Communication Equipment (DCE) reconfiguration)

## DOCUMENTS AFFECTED:

This RRS Modification Note 8, Revision A supersedes RRS Modification Note dated 3/13/2013.

[NWS EGB 9-715: RRS Sippican MKIIA SPS and Radiosonde Operations and Maintenance Manual](#)

NWS EHB 9-730: RRS System Administration Manual, Revision A

[TRS IDD for \(DCE\) Multiplexer, 200,285](#)

[Vaisala Radiosonde and SPS Operations and Maintenance Manual, M211417EN-D, dated April 2012](#)

[RRS Software Note 12, Installation of RWS Software Version 2.2](#)

## SUMMARY OF CHANGES

- Section A.1: Added requirement to return Sippican grounding strap to NLSC with Sippican SPS.
- Section A.2.4.2.3, Step a: Changed Channel 1 to Channel 2.
- Section A.5.7, first sentence: Added grounding symbol and added that grounding strap is provided by Vaisala.
- Section A.5.9.1, Step1: Changed SPS settings from S2-1: On to S2-2: On.
- Other minor editing changes.

## PROCEDURE:

The procedure for Vaisala SPS installation is provided in Attachment A.

## TECHNICAL ASSISTANCE:

For questions or problems pertaining to this note, contact the Sterling Field Support Center between the hours of 10z to 02z at: Primary (703) 661-1268 or Secondary (703) 661-1293, or e-mail at: [nws.sfsc@noaa.gov](mailto:nws.sfsc@noaa.gov).

**REPORTING INSTRUCTIONS:**

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in EHB-4, Maintenance Documentation, Part 4, and Appendix H. Include the following information on the EMRS report:

Maintenance Description (block 5): **Vaisala SPS Installation**

Equipment Code (block 7): **SPS**

Serial Number (block 8): **(enter current Sippican SPS serial number)**

Maintenance Comments (block 15): **Serial number of new SPS: \_\_\_\_\_ Installed new Vaisala SPS and returned old Sippican SPS to NLSC, I.A.W. RRS Mod Note 8A**

Mod No. (block 17a): **8A**

A sample EMRS report is provided as Attachment **B**.

Deirdre R. Jones  
Director, Operations Division

Attachment A – Vaisala SPS Installation Procedure  
Attachment B – Sample EMRS Report

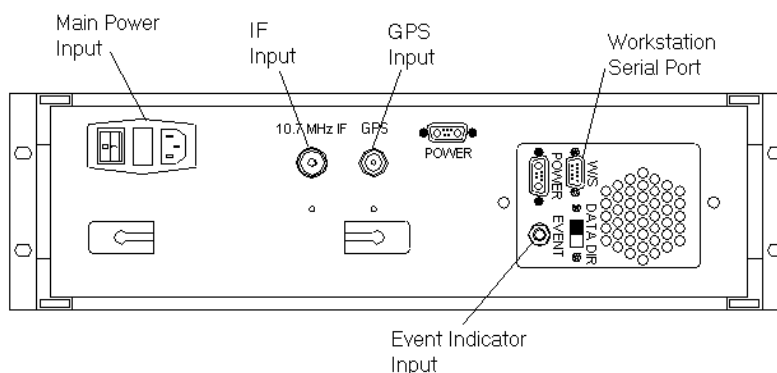


**ATTACHMENT A – Vaisala SPS Installation Procedure**

This modification note contains the procedures to remove the Sippican MkIIA Signal Processing System (SPS) Assembly (Figure A-1) and replace it with the Vaisala (SPS321AG) unit when requested by the Observing Systems Division (OPS22).

**A.1 Remove Sippican SPS from the TRS Rack****WARNING**

**Before removing any Line Replaceable Unit (LRU) from an MkIIA SPS, power-down the SPS equipment assembly at the Main Power switch to prevent possible equipment damage and personnel hazard.**



**Figure A-1: Sippican SPS Panel Connections - SPS Rear View**

1. Power down the SPS processor module using the main power rocker switch on the rear of the SPS Assembly.

**NOTE:** The three jumper cables must be removed for shipping and returned with the SPS to National Logistics Support Center (NLSC).

2. In accordance with the following procedures, disconnect all external cables that connect to the Sippican SPS Assembly. This includes the radome Global Positioning System (GPS) cable, the Telemetry Receiver System (TRS) Intermediate Frequency (IF) input cable, the Event indicator input, the RRS Workstation (RWS) serial cable, the maintenance serial cable if in use, and the alternating current (AC) power cord.
  - a. **RWS Maintenance Cable:** Disconnect the SPS maintenance cable (ASN: J700-1A3A7-1W3-A) from the serial port on the front of the SPS. Disconnect the other end of the SPS maintenance cable from the rear of the TRS Digital Communication Equipment (DCE) port I/O 2: channel 2. Remove the cable and return to NLSC with the Sippican SPS.
  - b. **RWS Data Cable:** Disconnect the RWS communication data cable (ASN: J700-1A3A7-1W2) from the RWS SPS serial port. The RWS serial port cable connects to the 9-pin male serial connector on the back of the SPS labeled W/S. Disconnect the other end of the RWS serial port cable connection to the 25-pin female serial connector I/O 1: Channel 2 from the rear of the TRS DCE (ASN: J700-1A3A4). Remove the cable and return to NLSC with the Sippican SPS.

- c. **IF Cable:** Disconnect the TRS IF signal cable (ASN: J700-1A3A7-1W1) with a UHF to a BNC adapter (ASN: J700-1A3A7-1A2, Sippican P/N 9019-145). The SPS IF input connector is a type UHF female connector located on the back of the SPS. The IF input port on the SPS is labeled 10.7 MHz IF. Disconnect the other end of the TRS IF cable from SK16 of the System Communication Assembly (SCA) (ASN: J700-1A3A3). Return the IF cable to NLSC with the Sippican SPS.
  - d. **Laptop Maintenance Cable:** Locate the 9-pin (F) to 9-pin (F) laptop null modem cable (ASN: J700-1A3A7-1W4, Sippican P/N: 9019-012) and return to NLSC with the Sippican SPS.
  - e. **AC Power Cord:** Disconnect the AC power cord to the three-pronged receptacle located in the MAIN POWER INPUT switch on the SPS. Disconnect the other end of the AC cord from the TRS Uninterruptible Power Supply (UPS) outlet receptacle. Remove the cable and return to NLSC with the Sippican SPS.
  - f. **Event Cable (NWS-provided):** The SPS Event Marker input port is a ¼-inch, tip-sleeve, phone-jack (type TS-jack) located on the back of the SPS. The Event Marker input port on the SPS is labeled EVENT. The Event cable/switch is provided separately by NWS, and is not currently being used by the field. If used or available, do not return this cable to NLSC. It will be used with the Vaisala SPS.
  - g. **GPS Cable (NWS-provided):** Disconnect the NWS-provided GPS signal coax cable from the GPS antenna located inside the TRS (ASN: J700-TRS) to the SPS. The GPS input connector of the SPS is a type N female connector located on the back of the SPS. The GPS input connector on the SPS is labeled GPS. Do not disconnect the other end of the cable. Do not return this cable to NLSC. It will be used with the Vaisala SPS.
  - h. **Grounding Strap (NWS-provided):** Detach the grounding strap from the SPS grounding lug at the rear of the Sippican SPS. Return the Sippican grounding strap to NLSC with the Sippican SPS.
3. Remove and retain the four mounting screws that secure the Sippican SPS Assembly mounting brackets to the TRS equipment rack, and carefully remove the SPS Assembly from the TRS equipment cabinet.
  4. In preparation for installing the Vaisala SPS, move the top retaining nuts ten holes above the bottom retaining nuts.
  5. Remove the three remaining jumper cables on the Sippican SPS prior to shipping. (Failure to remove these cables could directly damage the SPS during shipping.) Return these three cables to NLSC with the Sippican SPS.

**NOTE:** To prevent damage, the connectors of the following three jumper cables must be loosened at the same time (in unison).

- 9019-57 jumper cable (10.7 MHz IF) located on the front of the SPS
  - 9019-56 jumper cable (GPS) located on the front of the SPS
  - 9019-520 jumper cable (Power) located on the rear of the SPS
6. Pack the Sippican SPS and appropriate cables in an oversized box with ample padding to protect the SPS and ship the items to NLSC.

## A.2 RRS DCE Reconfiguration Procedure for Vaisala SPS Maintenance

**NOTE:** The Vaisala SPS installation requires the use of two unique Ethernet cables. One crossover type is locally provided by the site, and one straight-through type is included with the Vaisala SPS.

**NOTE:** Use the crossover Ethernet cable to connect the maintenance laptop to configure the DCE. Use the straight-through Ethernet cable to connect the maintenance laptop to the Vaisala SPS to run OMS for maintenance and troubleshooting purposes.

Section A.2 provides reconfiguration procedures for setting communications between the two DCEs using an Ethernet crossover cable connection. This procedure uses the current DCE configuration and will be applied for all NWS Upper Air RRS operations (optional for wireless link).

### A.2.1 DCE Ethernet Connection

The Ethernet crossover cable connection is required for DCE reconfiguration. This connection method can use an in-band management function (a RAD Kilomux feature) to configure both the office DCE and the radome (TRS) DCE using a laptop (or use the office RWS through the DCE main link).

### A.2.2 Laptop DCE Configuration Procedures – Windows 7

**NOTE:** A laptop running under *Windows 7* or *Windows XP* operating system can be used to reconfigure the DCE. *Windows 7* uses PuTTY (with Telnet protocol) for communications. *Windows XP* uses HyperTerminal (with Telnet protocol) for communications.

**NOTE:** To install PuTTY on a *Windows XP* laptop computer, complete Section A.7. Skip Section A.2.2 and Section A.2.3.

The following DCE configuration procedures use a laptop with *Windows 7* and PuTTY. Use a laptop with an Ethernet crossover cable. Configure the laptop computer prior to setting up the two DCEs using the following procedures.

#### A.2.2.1 Set TCP/IP Properties on a Laptop - Windows 7

Transmission Control Protocol/Internet Protocol (TCP/IP) properties must be set on a laptop in order to connect to the DCE. Perform the following as the default Administrator:

1. Go to the *Start* menu and select **Control Panel**.
2. Click **Network Connections** and **Local Area Connection**.

**NOTE:** If the laptop has no Local Area Connection established, go to the **Network and Internet Category** and perform the following:

- a. There are three options under the *Network* category: Click **View Network Status and Tasks**.
- b. The *Network and Sharing Center* screen will appear.
- c. Click **Local Area Connections** (or on left, click **Change Adapter Settings** to display Local Area Connections).

3. Right-click on **Properties** and select **Internet Protocol (TCP/IP)** on the list (Figure A-2).
4. Select **Internet Protocol Version 4**.
5. Click **Properties**. Write down all IPs, Subnet Mask, Gateway, and DNS information.

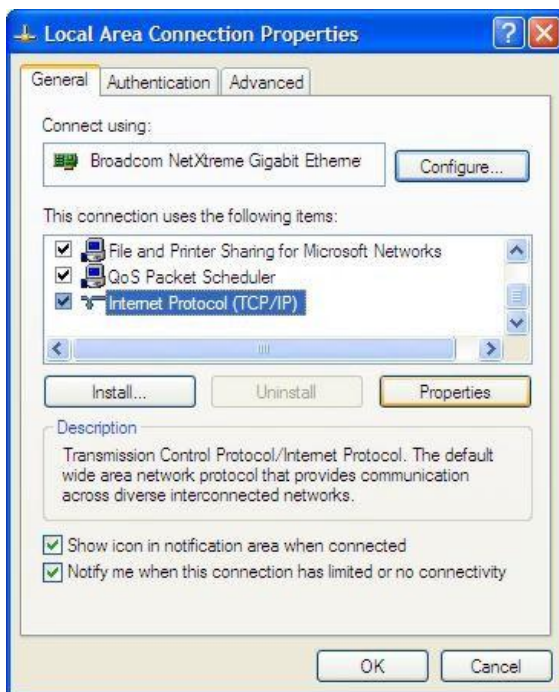


Figure A-2: Local Area Connection Properties

6. Select the option **Obtain an IP address automatically** on the General tab (Figure A-3).

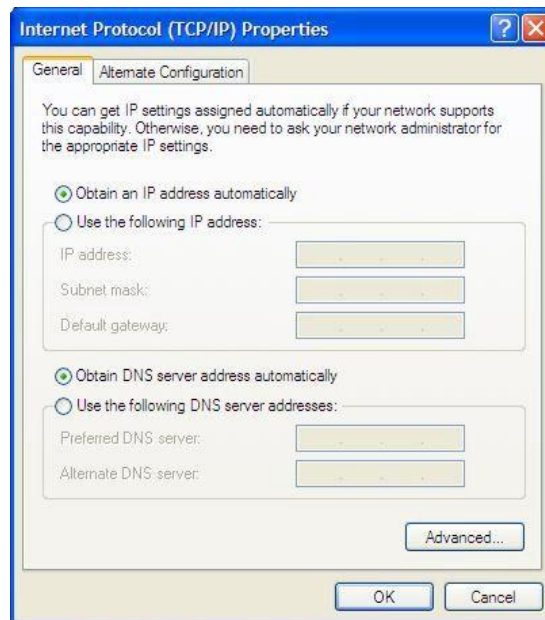
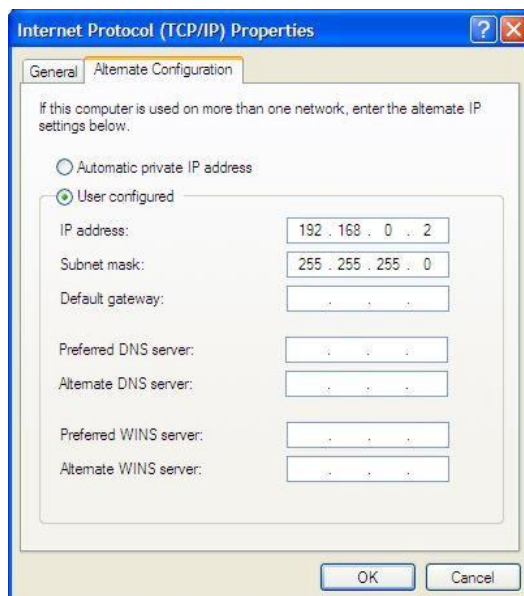


Figure A-3: Obtain IP Address Automatically



7. Go to the Alternate Configuration tab and select **User configured**. Fill in the following information for the Host PC (laptop) DCE IP address settings (Figure A-4):

- **IP address:** 192.168.5.10 (No leading zeros)
- **Subnet mask:** 255.255.255.0



**Figure A-4: Alternate Configuration (Example Only)**

8. Double-click **OK**. The TCP/IP configuration is now complete for laptop use on the DCE.

### A.2.3 DCE Configuration Procedures – *Windows 7*

**NOTE:** Use the Ethernet crossover cable (locally provided) with a laptop to reconfigure the DCE.

#### A.2.3.1 Required Configuration Tools

Use a laptop running *Windows 7* operating system using PuTTY for secure communications.

#### A.2.3.2 Install PuTTY – *Windows 7*

1. Log on to the RRS Workstation as the default **Administrator**.
2. Attach the external drive (flash, thumb, or hard) or CD to the RWS.
3. Open the RWS Program.
4. Click **START**, **COMPUTER**, and **DEFAULT (C:)**.
5. Click **LDAD** and right-click on **PuTTY.exe** (Telnet is a communications protocol under PuTTY).
6. Select **SEND TO** and left-click on an external drive or CD.
7. When the copy is complete, click **SAFELY REMOVE HARDWARE**, and eject the drive.
8. Remove drives or CD and close all windows.
9. Connect the external drive or CD to the laptop computer and copy **PuTTY** to the laptop.
10. Disconnect the external drive or CD from the laptop.

### A.2.3.3 Connect Laptop to DCE

1. Power off the DCE (that the laptop is connected to) prior to disconnecting any cables. If in the office, remove the DCE rack back panel, and power off from the switch on the back of the DCE and not from the front power strip.
2. Connect the Ethernet crossover cable to either DCE and to the laptop (Figure A-5).



Figure A-5: DCE Ethernet Cable Connector

**NOTE:** Configure the laptop with PuTTY and save two sessions, one named “TRS” and one named “RWS” as shown in Figure A-6 and Figure A-7. Note the changes in Host Name, Port, and Protocol. This should be all of the changes required.

3. Double-click **PuTTY**. The *PuTTY Configuration* screen will appear.
4. Enter the following IP address for the TRS DCE: **192.168.005.002**.
5. Enter **23** in the Port field.
6. Select **Telnet Protocol**.
7. Type **TRS** under Saved Sessions. Click **Save**.

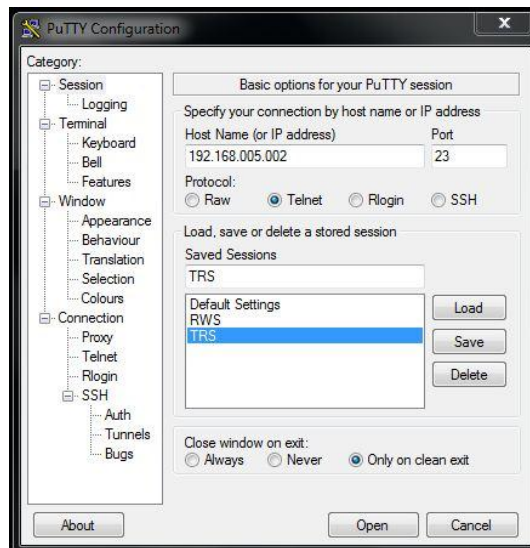


Figure A-6: PuTTY Configuration for TRS

8. Enter the following IP address for the RWS DCE: **192.168.005.001**
9. Enter **23** in the Port field.

10. Select **Telnet Protocol**.

11. Type **RWS** under Saved Sessions. Click **Save**.

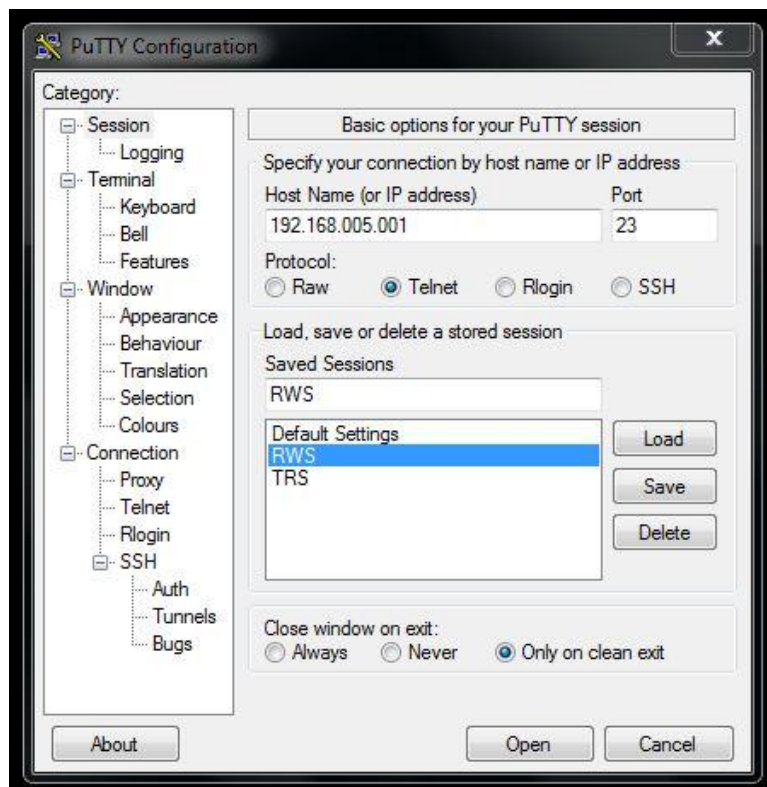


Figure A-7: PuTTY Configuration for RWS

#### A.2.4 DCE Parameter Setting Description

**NOTE:** Use the following procedures for both *Windows 7* and *Windows XP* laptops

This reconfiguration will only be performed on I/O 3 module, low-speed RS232 data module (KLS.1), which is in slot 9 on the DCE. Therefore, only I/O channel 3:1 and channel 3:2 parameters need to be reconfigured, but both RWS DCE and TRS DCE need to be reconfigured. The I/O channel 3:1 will be set as a default channel for Vaisala SPS maintenance communication. Channel 3:2 can be used as a spare channel.

Go to: <https://www.ops1.nws.noaa.gov/Secure/ehbs/EHB9/RRSmanuals1-7.htm> where publication number 200,285.000 dated March 2004, gives detailed instructions on the TRS Interface Design Description (IDD) for DCE multiplexer.

##### A.2.4.1 Required DCE I/O 3 Module Parameter Settings

1. To connect to the desired DCE, select **RWS**. Click **LOAD**.
2. Click **OPEN**. If connected properly, a terminal window will open that looks similar to Figure A-8.

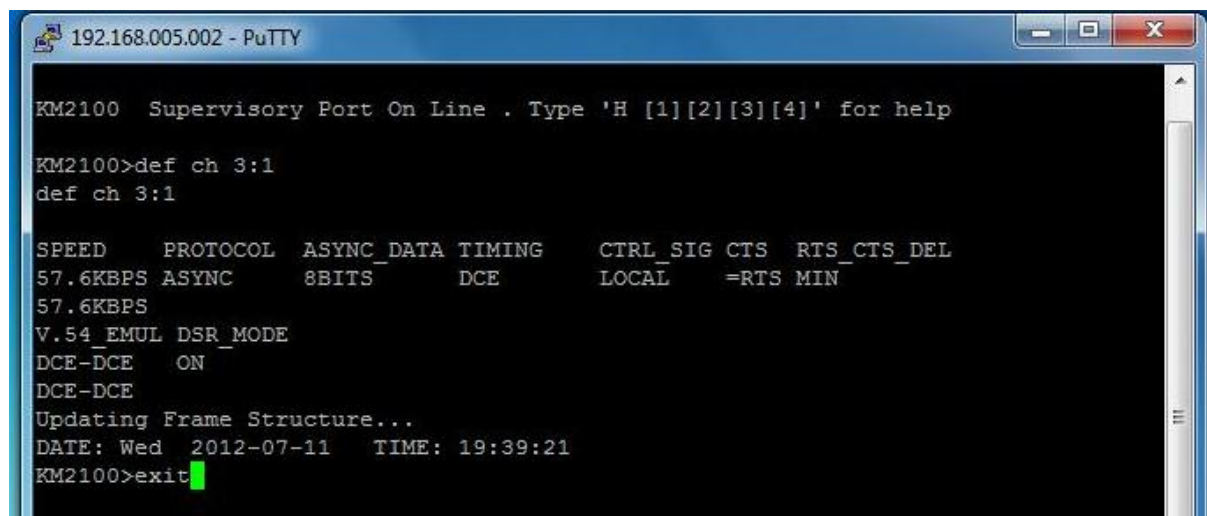


Figure A-8: Use PuTTY to Connect to DCE

#### A.2.4.2 Perform DCE I/O Module 3 Reconfiguration for RWS\_DCE

This procedure will be applied for both RWS\_DCE and TRS\_DCE. Perform RWS\_DCE reconfiguration first.

I/O 3 module parameter reconfiguration requirements are listed in Table A-1.

Table A-1: I/O Module Parameter Settings

PARAMETER (KLS.1)	CH 3:1 (ORIGINAL)	CH 3:2 (ORIGINAL)	CH 3:1 (RECONFIGURED)	CH 3:2 (RECONFIGURED)
<b>SPEED</b>	<b>9.6 KBPS</b>	<b>9.6 KBPS</b>	<b>57.6 KBPS</b>	<b>NC or 57.6 KBPS</b>
<b>Protocol</b>	ASYNC	ASYNC	ASYNC	ASYNC
<b>Data</b>	8 BITS	8 BITS	8 BITS	8 BITS
<b>Timing</b>	DCE	DCE	DCE	DCE
<b>Ctrl_Sig</b>	Local	Local	Local	Local
<b>CTS</b>	=RTS	=RTS	=RTS	=RTS
<b>RTS</b>	Min	Min	Min	Min
<b>V54_Emul</b>	DCE - DCE	DCE - DCE	DCE - DCE	DCE - DCE
<b>DSR_Mode</b>	On	On	On	On

##### A.2.4.2.1 Step 1 - DCE Reconfiguration

- a. Change I/O 3 module channel 2 speed parameter to **NC**. Type:

**DEF CH 3:2 < Enter >**

- b. The cursor should be under the Speed field (or use the space bar to move the cursor). Press the **F** or **B** key until the speed parameter is set to **NC**, then **< Enter >**, **< Enter >**.
- c. The DCE will display Updating Frame Structure.... If not, repeat Step 1.

**NOTE:** Do not use the backspace key when removing an error.

**A.2.4.2.2 Step 2 - DCE Reconfiguration**

- a. Set I/O 3 module channel 1 speed parameter to **57.6 KBPS**. Type:  
**DEF CH 3:1 < Enter >**
- b. The cursor should be under the Speed field. Press the **F** or **B** key until the speed parameter is set to **57.6 KBPS**, then **< Enter >**, **< Enter >**.
- c. The DCE will display `Updating Frame Structure...` If not, repeat Step 2.

**A.2.4.2.3 Step 3 - DCE Reconfiguration**

**NOTE:** Reconfiguration Step 3 must be performed only after Reconfiguration Step 1 where the parameter was changed to NC.

- a. Set I/O 3 module Channel 2 speed parameter to **57.6 KBPS**. Type:  
**DEF CH 3:2 < Enter >**
- b. The cursor should be under the Speed field. Press the **F** or **B** key until the speed parameter is set to **57.6 KBPS**, then **< Enter >**, **< Enter >**.
- c. The DCE will display `Updating Frame Structure...` If not, repeat Step 3.
- d. To verify that the DCE saved the channel configuration, enter **DSP CH CON**. The channel configuration will be displayed.

**A.2.4.2.4 Step 4 - DCE Reconfiguration**

End the current configuration session. Type:

**EXIT < Enter >**

**A.2.4.3 Perform DCE I/O Module 3 Reconfiguration for TRS\_DCE**

1. Change the DCE by typing **EXIT** in the *PuTTY* window. Select the other DCE (**TRS**), and click **LOAD**.
2. Click **OPEN**.
3. Repeat the four steps in Section A.2.4.2 for reconfiguring the TRS\_DCE.

**A.2.4.4 Reconfiguration of RWS-DCE Maintenance Port Cable**

1. After completing reconfiguration for both DCEs, power off the DCE (that the laptop is connected to) prior to disconnecting any cables. If in the office, remove the DCE rack back panel, and power off from the switch on the back of the DCE and not from the front power strip.
2. Disconnect the laptop Ethernet crossover cable from the DCE.
3. Disconnect the RWS-DCE P-2:2 cable (J700-2A1-I/O2:Ch2) from the RWS DCE Ch 2:2, and reconnect it to DCE Ch 3:1.
4. If in the office, replace the RWS DCE back panel.
5. For the TRS DCE (radome) maintenance cable, refer to the maintenance port connections included in Section A.5.6.

### A.3 Vaisala SPS321AG Connectors

#### A.3.1 Connector Panel

The connector panel (Figure A-9) is located at the back of the SPS. It has connectors for antenna signals, local area network (LAN), I/O signals, and power. The panel also includes a connector board, a printed circuit board which connects the I/O signals between the connectors, and an I/O extension board. Antenna signals and LAN are connected via cables to the plug-in units and the power inputs are wired from the connector to the motherboard. See Table A-2 for a list of the connector panel connectors.



Figure A-9: Vaisala SPS Connector Panel

Table A-2: Connector Panel Connectors

CONNECTOR	DESCRIPTION	NOTE
AC-LINE	Mains power connector	
VDC IN 24V	DC power connector	Not used
UHF ANTENNA	UHF antenna connector	Includes 20dB attenuator
GPS ANTENNA	GPS antenna connector	
VLF ANTENNA	VLF antenna connector	Not used
LAN1	LAN connector	Can be used for Maintenance PC
LAN2	LAN connector	Not used
CTRL	Control	
COM1	COM1	Maintenance PC
COM2	COM2	RWS
COM3	COM3	Not used
COM4	COM4	Not used
VGA	VGA display	Not used
KEYBOARD	Keyboard	Not used
MOUSE	Pointing device	Not used
USB1...4	Universal Serial Bus	Not used
AUDIO	Speakers	Not used




### A.3.2 Chassis Connectors

The chassis has connectors (Figure A-10 and Table A-3) for the Event Marker, GPS antenna, IF, and grounding connector. These are located at the back of the SPS.



Figure A-10: Chassis Connectors

Table A-3: Chassis Connectors

CONNECTOR	DESCRIPTION
EVENT MARKER	Event Marker connector
GPS ANT	GPS antenna connector
10.7 MHz IF	IF connector
	Grounding connector

## A.4 Vaisala SPS321AG Hardware Installation

The SPS is installed in the TRS rack.

### A.4.1 Power Supply and Grounding

The SPS must be connected to mains power 100-240V, 1.2A Max, 50/60Hz or to a 24 VDC power system. An external chassis ground screw is provided for system grounding.

### A.4.2 Installation Procedure

To install the SPS, follow the steps in the following sections.

#### A.4.2.1 Unpacking

The SPS and all necessary cables are delivered in one box. Before starting the mounting, unpack the SPS.

**A.4.2.2 Mounting**

The SPS is mounted in the TRS pedestal (Figure A-11).

1. Open the door of the TRS. There is a dedicated installation location for the SPS.



**Figure A-11: TRS Pedestal**

2. Hold the SPS firmly at the sides and lift (Figure A-12). Position the SPS on the rails in the TRS pedestal.



**Figure A-12: Lifting the SPS into Pedestal**



3. Using the handles, slide the SPS into the pedestal/rack (Figure A-13). If necessary, adjust the retaining nuts to match the rack mount holes.



**Figure A-13: Sliding the SPS into the Pedestal/Rack**

4. Fasten the SPS with screws (Figure A-14).



**Figure A-14: SPS Mounted in the TRS Pedestal**

### A.5 Vaisala SPS Cable Connections - Radome

After mounting the SPS in the TRS rack, go to the back of the rack to connect the cables (Table A-4).

<b>WARNING</b>
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**Before connecting or disconnecting any cables, make sure the power cord is NOT connected to the SPS and that the SPS is not powered on. Connect the power cord only after you have connected all other cables, otherwise the SPS serial port will hang up and require reinstallation of the SPS software.**

**Table A-4: Cables for Vaisala SPS**

LIST OF CABLES FOR VAISALA SPS		
CABLE	DESCRIPTION	CABLE ASN
Event Marker	NWS cable	J700-1A3W27
GPS Antenna	NWS cable	J700-1A4W1 & 2
SPS Ethernet Cable	212326, straight	J700-1A3A7-2W4
Intermediate	DRW227382	J700-1A3A7-2W1
COM1 (Maintenance)	DRW227384	J700-1A3A7-2W3
COM2 (Met Data)	DRW227383	J700-1A3A7-2W2
Mains Power	USA-type power cord	Provided with SPS
Grounding Strap	SPS chassis ground	Vaisala-provided

#### A.5.1 SPS to Radome DCE Cables

See Table A-5 for port information regarding the SPS to radome DCE cables.

**Table A-5: SPS to Radome DCE Cables**

SPS COMM PORT	DCE PORT	DCE SLOT	DCE I/O	DCE CH	KBPS	VAISALA CABLE #	CABLE ASN
10.7 MHz IF	TRS/SCA, SK16	7	1	1	19.2	DRW227382	J700-1A3A7-2W1
2	SPS-MET	7	1	2	19.2	DRW227383	J700-1A3A7-2W2
1	SPS MAINT	9	3	1	57.6	DRW227384	J700-1A3A7-2W3
N/A	SPARE	9	3	2	57.6 or NC	N/A	N/A
(Not connected to SPS)	UPS COMMS	8	2	1	2.4	N/A	J700-1A3A9W26

### A.5.2 SPS Event Marker Chassis Connector

1. If needed, connect the Event Marker cable to the Event Marker connector (ASN: J700-1A3A1) in the chassis of the SPS (1A3A7GPS-RX on cable).
2. Connect the other end of the cable 1A3A7 to the Event Marker in the interconnection box (phone jack connection). The Event Marker is not currently used for operational purposes (Figure A-15).



Figure A-15: Connecting the Event Marker Cable to the SPS

### A.5.3 GPS Antenna Chassis Connector

1. Connect the local GPS antenna cable to the GPS antenna connector on the chassis of the SPS.
2. Connect the other end of the GPS cable to 1A3A7-GPS Receiver in the interconnection box (Figure A-16).



Figure A-16: Connecting the GPS Antenna Cable to the SPS

#### A.5.4 IF Chassis Connector

1. Connect the IF cable (DRW227382) to the 10.7 MHz IF connector on the chassis of the SPS (which connects through DCE slot 7 I/O 1 CH 1). See Figure A-17.



Figure A-17: Connecting the IF Cable to the SPS

2. Connect the other end of the IF cable to the SCA (Figure A-18), SK 16 (ASN: J700-1A3A3-SK16).



Figure A-18: Connecting the IF Cable to the SCA

#### A.5.5 COM2 Serial Data Communication Cable

1. PTU: Connect the COM2 Met data cable (DRW227383) (ASN: J700-1A3A7-2W2) to the COM2 connector (ASN: J700-1A3A7-3A1) in the connector panel of the SPS (Figure A-19).

**NOTE:** The COM2 serial data communication cable may have the wrong ASN on the label.



Figure A-19: Connecting the COM2 Met Data Cable to the SPS



2. Connect the other end of the COM2 Met data cable to the DCE, Slot 7 I/O 1, CH 2 (Figure A-20).



Figure A-20: Connecting the COM2 Cable to Kilomux 2100

#### A.5.6 SPS Maintenance Serial Communication Cable

1. Connect the COM1 maintenance cable (DRW227384) (ASN: J700-1A3A7-2W3) to the COM1 connector (ASN: J700-1A3A2-3A1) in the connector panel of the SPS (Figure A-21).

**NOTE:** The SPS maintenance serial communication cable may have the wrong ASN on the label.



Figure A-21: Connecting the COM1 Cable to the SPS

2. Connect the other end of the maintenance cable (ASN: J700-1A3A4-2W3) to the DCE, slot 9 I/O 3, channel 1 (Figure A-22).

**NOTE:** The maintenance cable may have the wrong ports listed on the label.



Figure A-22: Connecting the COM1 Cable to the DCE (Example Only)

#### A.5.7 SPS Grounding Strap

Attach the Vaisala-provided grounding cable to the grounding connector on the rear of the SPS (Figure A-23).



Use one of the screws holding the SPS in place inside the TRS rack to attach the other end of the grounding cable.



Figure A-23: Vaisala SPS Grounding Connector

#### A.5.8 Vaisala Mains Power

1. Only after all other cables are connected, connect the power cord to the AC-LINE connector in the connector panel of the SPS (Figure A-24).

2. Connect the other end of the power cable to the UPS in the TRS.



**Figure A-24: Connecting the Mains Power Cable to the SPS**

### **A.5.9 Verify Connections**

Verify that all connections are correct and tight.

#### **A.5.9.1 Switching the SPS Power On and Off**

When the SPS is installed in the TRS pedestal, there is no need to use the power control switch ON the front panel. The SPS is automatically turned on when the power cord is connected and the power is turned on from the UPS switch.

1. Verify DIP Switch Settings. Check to ensure the DIP switches located behind the front panel of the SPS are set correctly. The SPS settings should be S2-1: Off, and S2-2: On. See Vaisala Manual M211417EN-D, dated 10 April 2012.
2. Turn on UPS power. The following startup sequence will take place on the front panel and take up to 3 minutes to complete.
  - The standby light emitting diode (LED) will turn yellow indicating that the system is ready for power-up.
  - The standby LED will turn blank and the power/status LED will start blinking green, indicating that the units are loading the Programmable Logic Device (PLD) codes and performing power-up tests.
  - The power/status LED will turn into steady green, indicating that the system is ready for operation.
  - If the power/status LED turns red, the system is faulty. In that case, wait for the power-up sequence to end.
3. Use the UPS switch to turn off the power.

### **CAUTION**

**When the power of the SPS is on, do not pull the power plug or otherwise turn the unit off immediately after a sounding. Always wait for at least five minutes after a sounding has finished before turning the SPS off. Removing power while the SPS is working might corrupt the database. If the database gets corrupted, the unit will not start correctly and will need to be replaced.**

**THIS COMPLETES THE VAISALA SPS INSTALLATION.**

**NOTE:** Perform troubleshooting of the Vaisala SPS (with a laptop) using OMS (with Vaisala Maintenance software) in accordance with RRS Maintenance Note 9.

#### A.6 Prepare the Radiosonde Using GC25-FSD

1. Prepare the radiosonde for launch with Frequency Setting Device (GC25- FSD).

**NOTE:** Connect the radiosonde to the battery only after the sounding preparations have been performed as instructed in this section. Frequency setting is possible only when the radiosonde battery is not connected.

2. Place the radiosonde on the radiosonde tray of the FSD by carefully sliding the lifting post to its place (Figure A-25 and Figure A-26).



Figure A-25: Placing the Radiosonde in the FSD



Figure A-26: Correct Placement of the Radiosonde in the FSD

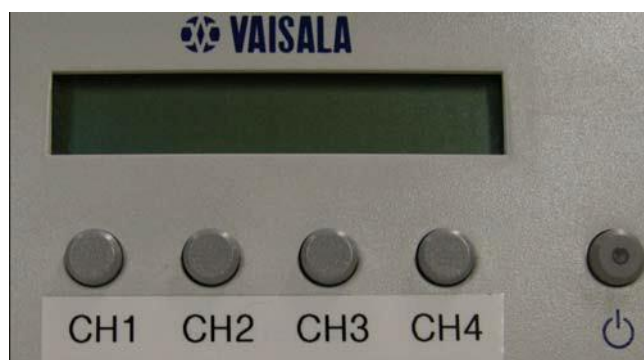


3. Connect the communication cable to the GC25-FSD interface in the radiosonde. The text “UP” on the connector faces upwards (Figure A-27).



**Figure A-27: Connecting the Communication Cable**

4. Plug in the power cable and turn on the FSD by pressing the **power switch**. The green LED in the power switch will be lit.
5. The message RS92-NGP detected will appear on the display. The FSD will set the default frequency of 1680 MHz automatically and start to recondition the humidity sensor.
6. The reconditioning will take 3 minutes. The time will be shown on the display.
7. To set another frequency, change the channel by pressing the buttons below the display at any time when the FSD is switched on and the radiosonde is connected to it (Figure A-28). Channel Frequency:
  - CH1 1676 MHz
  - CH2 1678 MHz
  - CH3 1680 MHz (Default setting)
  - CH4 1682 MHz



**Figure A-28: Channel Selection Buttons**

8. When the FSD reconditioning is complete, the message Radiosonde is ready will appear on the display. Turn off the FSD, remove the radiosonde from the tray, and disconnect the communication cable.

### A.7 Alternate Laptop DCE Configuration Procedures – Windows XP Operating System

Use a laptop with an Ethernet crossover cable (locally provided). Configure the laptop computer prior to setting up the two DCEs using the following procedures. The following DCE configuration procedures use a laptop with *Windows XP* and PuTTY.

**NOTE:** A laptop running under *Windows 7* or *Windows XP* operating system can be used to reconfigure the DCE. *Windows 7* uses PuTTY (with Telnet protocol) for communications. *Windows XP* uses either PuTTY or HyperTerminal (with Telnet protocol) for communications.

#### A.7.1 Laptop Parameter Settings for Ethernet Connection to DCE

DCE IP addresses setting:

RWS DCE: 192.168.005.001
TRS DCE: 192.168.005.002

#### A.7.2 Set TCP/IP Properties on a Laptop with Windows XP

TCP/IP properties must be set on a laptop in order to connect to the DCE. Perform the following as the default Administrator:

1. Go to the *Start* menu and select **Control Panel**.
2. Click **Network Connections** and **Local Area Connection**.
3. Right-click **Properties** and select **Internet Protocol (TCP/IP)** on the list (Figure A-29).
4. Click **Properties**. Write down all IP's, Subnet Mask, Gateway, and DNS information.

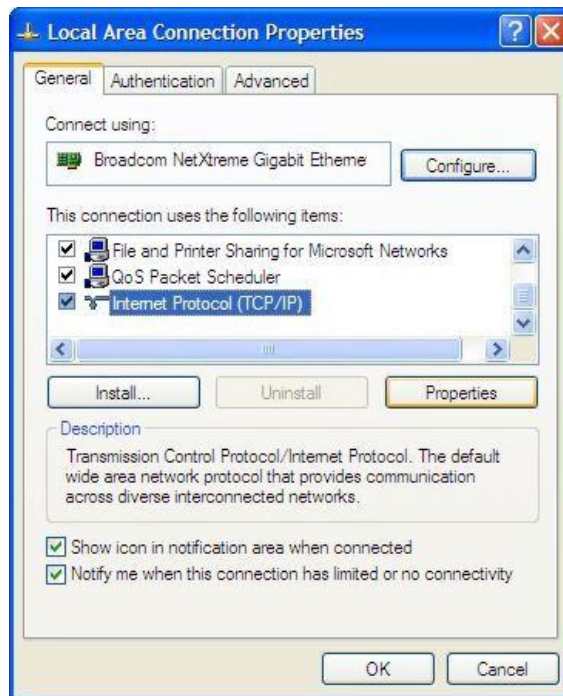
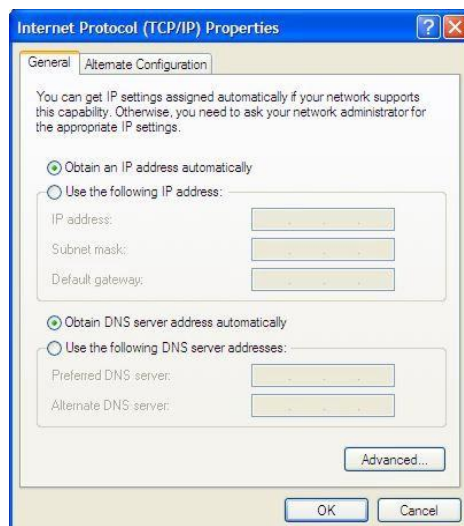


Figure A-29: Local Area Connection Properties

5. Select the option **Obtain an IP address automatically** on the General tab (Figure A-30).



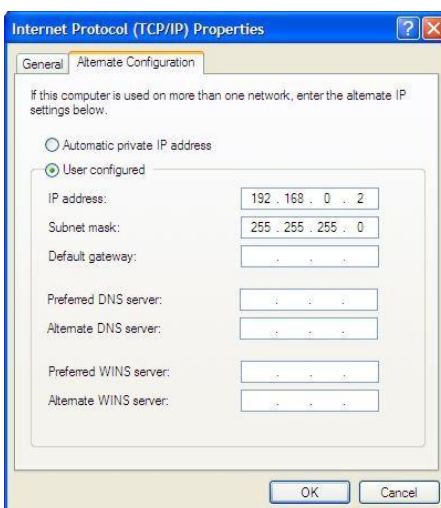
**Figure A-30: Obtaining IP Address Automatically**

6. Go to the Alternate Configuration tab and select **User configured**. Fill in the following information for the Host PC (laptop) DCE IP address settings (Figure A-31):

IP address: **192.168.5.10** (No leading zeros.)

Subnet mask: **255.255.255.0**

7. Click **OK**. The TCP/IP configuration is now complete for laptop use on the DCE.  
8. Click **Close**.



**Figure A-31: Alternate Configuration (Example Only)**

### A.7.3 DCE Configuration Procedures – *Windows XP*

**NOTE:** Use the locally provided Ethernet crossover cable with a laptop to reconfigure the DCE.

### A.7.3.1 Required Configuration Tools

A laptop running *Windows XP* operating system using PuTTY for secure communications is required for this alternate procedure.

### A.7.3.2 Install PuTTY – Windows XP

1. Log on to the RRS Workstation as the default **Administrator**.
2. Attach the external drive (flash, thumb, or hard) or CD to the RWS.
3. Open the RWS Program.
4. Click **START, MY COMPUTER**, and **RWS DRIVE (C:)**.
5. Double-click **LDAD** and right-click on **PuTTY** (Telnet is a communications protocol under PuTTY).
6. Select **SEND TO** and left-click on the external drive or CD.
7. When the copy is complete, click **SAFELY REMOVE HARDWARE**, and eject the drive.
8. Remove the drives or CD and close all windows.
9. Connect the external drive or CD to the laptop computer and copy **PuTTY** to the laptop.
10. Disconnect the external drive or CD from the laptop.

### A.7.3.3 Connect Laptop to DCE

1. Connect the Ethernet crossover cable to either DCE and to the laptop (Figure A-32).

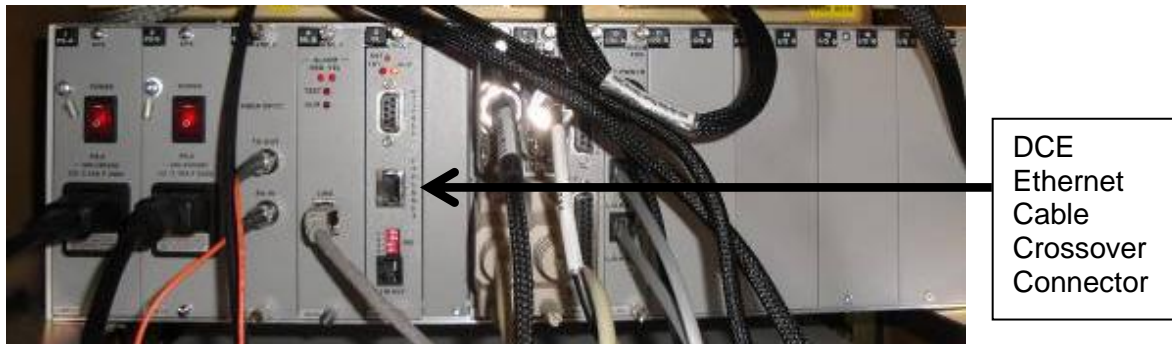


Figure A-32: DCE Ethernet Cable Connector

**NOTE:** Configure the laptop with PuTTY and save two sessions, one named TRS and one named RWS as shown in Figure A-33 and Figure A-34. Note the changes in Host Name, Port, and Protocol. This should be all the changes required.

2. Double-click on **PuTTY**. The *PuTTY Configuration* screen will appear.
3. Enter the following IP address for the TRS DCE: **192.168.005.002**
4. Enter 23 in the Port field.
5. Select **Telnet Protocol**.
6. Type **TRS** under Saved Sessions. Click **Save**.

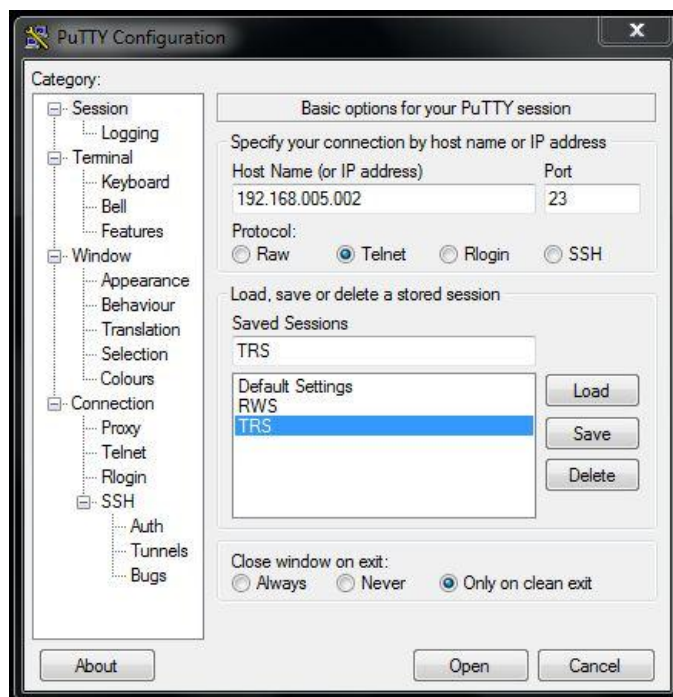


Figure A-33: PuTTY Configuration for TRS

7. Enter the following IP address for the RWS DCE: **192.168.005.001**.
8. Enter **23** in the Port field.
9. Select **Telnet Protocol**.
10. Type **RWS** under Saved Sessions. Click **Save**.

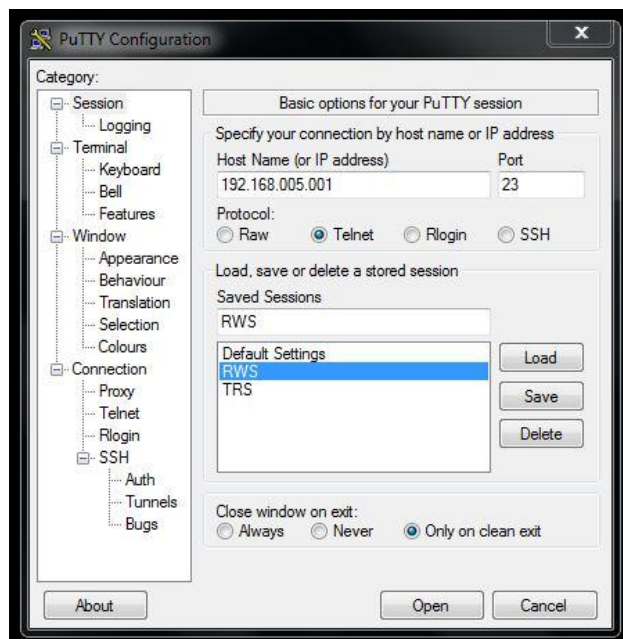


Figure A-34: PuTTY Configuration for RWS

11. Go to Section A.2.4 to perform DCE reconfiguration.

### A.8 Vaisala SPS Operating Software

When required to install or reinstall Vaisala SPS Operating Software V1.0.4, download software from the OPS1 Web site (<https://www.ops1.nws.noaa.gov/>). Use [Vaisala Manual M211417EN-D, dated April 2012](#) (also available on the OPS1 Web site) to install software.

**NOTE:** Use the straight-through Ethernet cable to connect the maintenance laptop to the Vaisala SPS to install or reinstall Vaisala SPS operating software.

### A.9 Vaisala SPS Maintenance Software-Maintenance Laptop

The Sippican maintenance software communications protocol uses a Serial Channel. The Vaisala maintenance software communications protocol uses Ethernet. If switching from a Sippican SPS to a Vaisala SPS, the Vaisala maintenance software must be uninstalled and reinstalled.

Reinstallation should be made on the maintenance laptop to change the communication protocol from Serial Channel to Ethernet. Go to RRS Maintenance Note 9 to reinstall *VaisalaSPSMaint* software and to select the *Ethernet Connection Type*.

### A.10 New Radiosonde Type

After completing the initial installation of the Vaisala SPS, the **Radiosonde Type** must be changed to **VaisalaRS92-NGP (P sensor)** in the RWS V2.2 software *Station Data Display* window. See *Local Station Data* in RRS Software Note 12 for directions.



## ATTACHMENT B - Sample EMRS Report

New A26 Commit A26 Place on Hold Cgpy A26 Delete A26 Detail Report Document Summary Create USOS Help

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**GENERAL INFORMATION**

NEW RECORD WFO\* TBW Document No.\* TBW130214002

1. Open Date 02/14/2013 Open Time 09:00 Local ☒ Local ☐ UTC 2. Op Initials WSH 3. Response Priority ☐ Immediate ☐ Low ☐ Routine ☒ Not Applicable 4. Close Date 02/14/2013 Close Time 12:00

5. Maintenance Description 476 characters left UPPER AIR  
Vaisala SPS Installation

---

**EQUIPMENT INFORMATION**

6. Station ID\* TBW 7. Equipment Code\* SPS 8. Serial Number 062017 9. TM M 10. AT M 11. How Mal 999

Alert: Time Remaining: 0:00 (For Block 12 use only)

---

**12. EQUIPMENT OPERATIONAL STATUS TIMES**

a. Fully Operational		b. Logistic Delay		c. All Other		d. Logistic Delay		e. All Other	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
								3	0

---

**13. PARTS USAGE and CONFIGURATION MANAGEMENT REPORTING**

ASN	Vendor Part No. (New Part)	Serial Number (Old Part)	Serial Number (New Part)	
				New Row
				Delete Row

---

**14. WORKLOAD INFORMATION**

a. Routine		b. Non-Routine		c. Travel		d. Misc		e. Overtime	
Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes
						3	0		

---

**MISCELLANEOUS INFORMATION**

15. Maintenance Comments 613 characters left View Status History Attachments  
Serial Number of new Vaisala SPS: \_\_\_\_\_  
Installed new Vaisala SPS and returned old Sippican SPS to NLSC, I.A.W. RRS Mod Note 8

16. Tech Initials GAF

☐ Contract Maintenance Disclaimer Number of Technicians: 1

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**17. SPECIAL PURPOSE REPORTING INFORMATION**

a. Mod No. 8 b. Mod Act/Deact Date 02/14/2013 c. Block C d. Trouble Ticket No. e. USOS Outage Doc No. Expand

---

**18. Work Order Information:**

Work Accomplished by  
☐ Region Headquarters ☒ Electronics ☐ WFO/Office ☐ Facilities  
☐ Maintenance Contractor

Est. Cost or Bid \$ Req. Completion Date  
Contractor Maintenance Time  
Hours Minutes

Commit A26 Schedule on Commit Place on Hold Schedule on Hold Copy A26 New A26 Cancel

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